ENVIRONMENTAL ASSESSMENT
Fisheries Division
Montana Fish, Wildlife and Parks
Yellowstone cutthroat trout introduction into Esp/Chambers Spring Creek

General Purpose: The Sweet Grass County Conservation District recently completed a restoration project on Esp/Chambers spring creek to improve water quality and to provide for spawning and rearing opportunities for trout residing in the mid-Yellowstone River. This restoration project, located near the town of Big Timber, involved the removal of two migration barriers near the mouth of the spring creek, the re-construction of the stream channel to create an appropriate dimension and profile, and the control of livestock within the riparian corridor. The purpose of the currently proposed project is to expedite the re-colonization of Yellowstone cutthroat trout into the newly restored Esp/Chambers spring creek. This proposal calls for the re-introduction of Yellowstone cutthroat trout into the stream using fertilized eggs placed into an off-stream incubator.

Background: The mid-Yellowstone River, located in the vicinity of the town of Big Timber, is dominated by rainbow trout, brown trout, mountain whitefish and native suckers. Table 1 displays relative abundance of the fish species currently found in this reach of river. Most of the trout species residing in the mid-Yellowstone River prefer to utilize the lower reaches of the tributaries for spawning and rearing. However, nearly all of these tributaries provide very limited spawning and rearing habitat due to severe dewatering during the irrigation season and to man-caused habitat alterations. Poor spawning and rearing habitat appears to be limiting recruitment of juveniles into the river and, in association, influences the density and size structure of trout populations in the river. As a result, this reach of the Yellowstone River contains fewer trout (especially rainbow trout and Yellowstone cutthroat trout) and an under-represented number of yearling fish than a river reach (Ninth Street Section) located about 30 miles upstream near the town of Livingston (Table 2).

In 1996, Montana Fish, Wildlife and Parks (FWP), with assistance from the U.S. Department of Agriculture, initiated a survey of the spring-fed creeks and riparian areas along an eight mile reach of the Yellowstone River between the towns of Big Timber and Greycliff to determine the feasibility of improving spawning and rearing habitat for trout residing in the river (U.S. Department of Agriculture, 1996). Esp/Chambers spring creek was identified in this survey as one of several degraded streams that, if restored, could provide valuable additions to the spawning and rearing habitat available in the area. This spring creek has recently been restored by removing migration barriers, re-constructing the degraded channel, and protecting the riparian corridor from over-grazing by livestock. Restoration of this stream will provide additional spawning and rearing habitat for primarily spring spawning species such as rainbow trout and Yellowstone cutthroat trout. Trout residing in the river will likely pioneer into this newly created habitat. The proposed re-introduction of Yellowstone cutthroat trout is an attempt to expedite the utilization of this habitat.

The species proposed for re-introduction into this newly restored spring creek is Yellowstone cutthroat trout. The Yellowstone cutthroat trout is listed as a species of special concern in Montana and has recently been petitioned for listing under the Endangered Species Act. A recent status assessment of the species indicates that genetically pure Yellowstone cutthroat trout occupy only 10% of their historical range. Under this proposal, the re-introduction of Yellowstone cutthroat trout into Esp/Chambers spring creek would probably not expand the range of genetically pure fish because of their likely hybridization with rainbow trout. However, a recently completed report addressing the conservation of Yellowstone cutthroat trout calls for the stocking of only genetically pure fish within watersheds having streams that are connected to habitats supporting genetically pure Yellowstone cutthroat trout (May, et al., 1998). Esp/Chambers spring creek falls with this category.

Table 1. Relative abundance of fish species found in the mid-Yellowstone River located near the town of Big Timber.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE
Rainbow trout	Oncorhynchus mykiss	Abundant
Brown trout	Salmo trutta	Abundant
Yellowstone cutthroat trout	Oncorhynchus clarki bouvieri	Rare
Brook trout	Salvelinus fontinalis	Rare
Mountain whitefish	Prosopium williamsoni	Abundant
White sucker	Catostomus commersoni	Abundant
Longnose sucker	Catostomus catostomus	Abundant
Mountain sucker	Catostomus platyrhynchus	Rare
Shorthead redhorse	Maxostoma macrolepidotum	Rare
Common carp	Cyprinus carpio	Common
Longnose dace	Rhinichthys cataractae	Common
Lake chub	Couesius plumbeus	Rare
Mottled sculpin	Cottus bairdi	Common

Table 2. Fish population data collected during the fall of 1992 from the Big Timber section of the Yellowstone River (7.1 mile section from one-half mile below the mouth of Little Timber Creek to one-half mile below the mouth of Otter Creek) with comparisons to the Ninth Street Section (Ninth Street data from Tohtz, 1996).

DATE	FISH SPECIES	SIZE CLASS	NUMBER ESTIMATE	ESTIMATED NUMBER/MI.	WEIGHT ESTIMATE (LB.)
OCT. 1992	RAINBOW TROUT	4.00- 5.99	287	40	18
		6.00-7.99	532	75	84
		8.00-9.99	2023	285	585
		10.00-11.99	912	128	429
		12.00-13.99	347	49	280
		14.00-15.99	297	42	369
		16.00-21.99	384	54	750
		TOTALS	4782	673	2515
SPRING 1992	RAINBOW TROUT	NINTH STREET SECTION NEAR LIVINGSTON		1585	
SPRING 1992	YELLOWSTONE CUTTHROAT TROUT	NINTH STREET SECTION NEAR LIVINGSTON		227	
OCT. 1992	BROWN TROUT	6.00-7.49	12	2	1
		7.50-8.99	118	17	27
		9.00-10.49	486	68	164
		10.50-11.99	424	60	209
		12.00-13.49	178	25	129
		13.50-14.99	114	16	116
		15.00-16.49	90	13	124
		16.50-17.99	83	12	164
		18.00-23.99	474	67	1306
		TOTALS	1979	280	2240
SPRING 1992	BROWN TROUT	NINTH STREET SECTION NEAR LIVINGSTON		308	

I. Location of Project: This proposed project will be undertaken on a small unnamed spring creek located approximately 10 miles east of the town of Big Timber within Township 1 North, Range 15 East, Section 35 in Sweet Grass County (see Figure 1).

II. Need for the Project: Spawning and rearing habitat for trout residing in the mid-Yellowstone River appear limited, resulting in reduced recruitment of young fish into the river. This reduced recruitment appears to adversely influence the density and size structure of trout populations in the river. Densities of trout are substantially lower in the reach of river near Big Timber (especially rainbow trout and Yellowstone cutthroat trout) than the reach of river near

Livingston. Recently, a habitat restoration project was completed on Esp/Chambers spring creek involving the removal of migration barriers, channel re-construction, and riparian corridor protection. The intent of this restoration project was to create additional spawning and rearing habitat for trout residing in the mid-Yellowstone River. The current project proposes to re-introduce Yellowstone cutthroat trout into the restored spring creek in an attempt to expedite the utilization of this newly created spawning and rearing habitat.

III. **Scope of Project:** The proposal calls for the re-introduction of Yellowstone cutthroat trout into Esp/Chambers spring creek using fertilized eggs placed into an off-stream incubator. This off-stream incubator consists of a five gallon plastic bucket that contains perforated egg trays. The incubator would be staked adjacent to the channel with an attached PVC pipe that extends into the active channel in an upstream direction. Water entering the PVC pipe flows into the incubator and through the perforated trays allowing for egg development. An outflow pipe attached to the top of the incubator allows swim up fry to enter the stream following hatching.

The project proposes to use a single incubator that would contain between 3,000 and 5,000 fertilized eggs. Fertilized eggs would be obtained from the Montana Fish, Wildlife and Parks Yellowstone River Trout Hatchery located in Big Timber. The project calls for the re-introduction of Yellowstone cutthroat trout eggs into Esp/Chambers spring creek for three consecutive years. The incubator would be installed each spring for approximately 30 to 50 days.

IV. **Environmental Impact Checklist:** Please see attached list.

V. **Explanation of Impacts to the Physical Environment**:

1. Terrestrial and aquatic life and habitats

With the removal of migration barriers on Esp/Chambers spring creek and the restoration of the stream channel, migrant spawners from the Yellowstone River will likely utilize the stream in spite this proposed project. As a result, adverse impacts on the existing fishery and invertebrate populations associated with this proposed project would be negligible. The attempt to expedite the use of newly created spawning and rearing habitat in the spring creek through the introduction of fertilized Yellowstone cutthroat trout eggs would accelerate expected improvements in trout populations in both the spring creek and the river. Yellowstone cutthroat trout are native to this section of the Yellowstone River and have evolved and coexisted with other native fish species present in the river. As a result of this historic association, impacts on existing native fish populations should be minimal.

9. Unique, endangered, fragile, or limited environmental resources

The Yellowstone watershed contains Yellowstone cutthroat trout, a species of special concern in Montana and a species recently petitioned for listing under the Endangered Species Act. Under this proposal, the re-introduction of Yellowstone cutthroat trout into Esp/Chambers spring creek would probably not expand the range of genetically pure fish

because of their likely hybridization with rainbow trout. However, a recently completed report addressing the conservation of Yellowstone cutthroat trout calls for the stocking of only genetically pure fish within watersheds having streams that are connected to habitats supporting genetically pure Yellowstone cutthroat trout (May, et al., 1998). Esp/Chambers spring creek falls with this category. Additionally, there is a limited possibility that this project could create an isolated population of genetically pure fish due to the corresponding overlap in the timing of spawning by Yellowstone cutthroat trout and the need for higher river flows to provide access to the restored spring creek.

VI. Explanation of Impacts on the Human Environment:

7. Access to & quality of recreational activities.

It is anticipated that the re-introduction of Yellowstone cutthroat trout into Esp/Chambers spring creek would expedite the utilization of newly created spawning and rearing habitat. Recruitment of juvenile fish into the river would then be expected to increase at an accelerated rate, resulting in a more rapid improvement to the recreational fishery.

10. Demands for government services.

Fertilized eggs would be provided by the FWP Yellowstone River Trout Hatchery in Big Timber. The project would require a total of 9,000 to 15,000 fertilized eggs for the three year scope of work. Because the Yellowstone River Trout Hatchery produces an excess number of eggs each year, this proposed project would not adversely impact annual stocking plans for other Montana waters.

VII. Discussion and Evaluation of Reasonable Alternatives.

1. No Action Alternative

If no action is taken, migrant trout spawners from the Yellowstone River will likely pioneer into the newly restored spring creek. This pioneering process, however, would likely occur very slowly. As a result, improvements in trout populations in both the spring creek and the Yellowstone River likely would be delayed.

2. Introduce rainbow trout or brown trout

An alternative to the proposed action would be to introduce either rainbow trout or brown trout into Esp/Chambers spring creek. Rainbow trout, because of their spring spawning characteristics, would probably establish a migratory population between the river and spring creek. Brown trout, however, spawn in the fall and, as a result, would probably be unable to establish a migratory population because of access difficulties created by low river flows during the fall. Both of these species are non-native to the Yellowstone watershed. As such, introductions of either rainbow trout or brown trout would be counter to recommendations for conserving Yellowstone cutthroat trout in Montana.

3. Introduce juvenile and/or adult Yellowstone cutthroat trout

An alternative to the proposed action would be to introduce juvenile or adult Yellowstone cutthroat trout instead of fertilized eggs. Preliminary results from experimental introductions of fertilized westslope cutthroat trout eggs into a small tributary located west of the continental divide have indicated that newly hatched juveniles tend to remain in the stream for 2 or 3 years prior to migrating out of the tributary. In contrast, attempts at stocking fingerlings have shown that the newly stocked fish tend to migrate almost immediately out of the tributary. Juvenile cutthroat trout that remain in their natal tributary for two to three years improve both their chances of survival and their likelihood to return to the stream to spawn as sexually mature adults.

4. The Preferred Alternative

The preferred alternative is to re-introduce Yellowstone cutthroat trout into Esp/Chambers spring creek using fertilized eggs placed into an off-stream incubator. Trout populations in the mid-Yellowstone River appear recruitment limited due to degraded habitat, especially in the lower reaches of the tributaries to the river. This re-introduction effort would expedite the utilization of newly created spawning and rearing habitat in Esp/Chambers spring creek. Recruitment of juvenile fish into the river would then be expected to increase at a more rapid rate, resulting in an improvement to the recreational fishery. The use of Yellowstone cutthroat trout for this project complies with recommendations established for the conservation of this species of special concern in Montana. The use of fertilized eggs placed in an off-stream incubator, although experimental, may encourage newly hatched juveniles to remain in their natal tributary for two to three years, thereby improving both their chances of survival and their likelihood to return to the stream to spawn as sexually mature adults.

VIII. Environmental Assessment Conclusion Section

1. Is an EIS required? No.

We conclude from this review that the proposed activities will have a positive impact on the physical and human environment.

2. Level of public involvement.

The Environmental Assessment (EA) is being distributed to all individuals and groups listed on the cover letter. The EA will be published on the Montana Electronic Bulletin Board.

3. Duration of comment period?

Public comment will be accepted from March 25 through April 23, 1999.

4. Person responsible for preparing the EA.

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ENVIRONMENTAL ASSESSMENT

Project Title Yellowstone cutthroat trout introduction into Esp/Chambers Spring Creek

Division/Bureau Fisheries Division -Future Fisheries Improvement
Description of Project The project is being proposed to re-introduce Yellowstone cutthroat trout into the newly restored Esp/Chambers spring creek using fertilized eggs placed into an off-stream incubator. Esp/Chambers spring creek is a tributary to the mid-Yellowstone River located approximately 10 miles east of the town of Big Timber.

POTENTIAL IMPACT ON PHYSICAL ENVIRONMENT

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Terrestrial & aquatic life and habitats		X				X
2. Water quality, quantity & distribution				X		
3. Geology & soil quality, stability & moisture				X		
4. Vegetation cover, quantity & quality				X		
5. Aesthetics				X		
6. Air quality				X		
7. Unique, endangered, fragile, or limited environmental resources			X			X
8. Demands on environmental resources of land, water, air & energy				X		
9. Historical & archaeological sites				X		

POTENTIAL IMPACTS ON THE HUMAN ENVIRONMENT

	MAJOR	MODERATE	MINOR	NONE	UNKNOWN	COMMENTS ON ATTACHED PAGES
1. Social structures & mores				X		
2. Cultural uniqueness & diversity				X		
3. Local & state tax base & tax revenue				X		
4. Agricultural or industrial production				X		
5. Human health				X		
6. Quantity & distribution of community & personal income				X		
7. Access to & quality of recreational and wilderness activities			X			X
8. Quantity & distribution of employment				X		
9. Distribution & density of population & housing				X		
10. Demands for government services			X			X
11. Industrial & commercial activity				X		
12. Demands for energy				X		
13. Locally adopted environmental plans & goals				X		
14. Transportation networks & traffic flows				X		

Other groups or agencies contacted or which may have overlapping jurisdiction Sweet Grass County Conservation District, U.S. Fish and Wildlife Service, Trout Unlimited

Individuals or groups contributing to this EA None

Recommendation concerning preparation of EIS No EIS required.

EA prepared by : Mark Lere

Date: March 23, 1999

REFERENCES CITED

May, Bruce E. et al. 1998. Yellowstone cutthroat trout program with the State of Montana. Prepared for: Montana Fish, Wildlife and Parks. 44 pp.

Tohtz, Joel. 1996. Fisheries investigations in the Yellowstone and Shields River basins, Park County, Montana. Progress Report for Fed. Aid. Project F-78-R-1 and F-78-R-2. 22 pp.

U.S. Department of Agriculture. 1996. Cooperative river basin study Greycliff area spawning channels development. In coop. with Mt Dept. of Nat. Res. and Cons. and MT Dept. of Fish, Wildlife and Parks. 6 pp.